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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/643,986	08/20/2003	Peter H. McDonald	CS-21,295	4994

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PRAXAIR, INC.
LAW DEPARTMENT - MI 557
39 Old Ridgebury Road
Danbury, CT 06810-5113

EXAMINER	
VERSTEEG, STEVEN H	
ART UNIT	PAPER NUMBER
1753	

DATE MAILED: 11/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/643,986	MCDONALD, PETER H.	
	Examiner	Art Unit	
	Steven H VerSteeg	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 January 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4 and 7-20* is/are rejected.

7)☒ Claim(s) *5 and 6* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 August 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *8/20/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: **16** [0016]. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC §§ 102 & 103

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 3, 8, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,187,151 B1 to Leiphart in view of US 5,846,389 to Levine et al. (Levine).

5. For claim 1, Applicant requires a method of dry treating a target surface prior to using the target for sputtering comprising preparing a target assembly and securing the target assembly in a vacuum chamber of a magnetron sputtering apparatus; energizing the magnetic component of the magnetron sputtering apparatus with a power between about 0.2 kW and about 4 kW for a period of time between about 4 and about 30 minutes to produce a surface dry treatment of a sputtering ion plasma on an exposed surface of the target to effectively reduce inherently undesirable impurities on the surface; and removing the treated target assembly from the magnetron sputtering apparatus.

6. For claim 16, Applicant requires a magnetron sputtering apparatus comprising a vacuum chamber with a surface defining an opening adapted for securing a removable target assembly; support structure surrounding the opening of the vacuum chamber and spaced outside of the securing means for the removable target; a rotating magnet assembly secured to the support structure and disposed over the opening and adapted to be spaced apart from the removable target assembly; motor means for rotating the magnet assembly; and power means for energizing the magnet assembly.

7. Leiphart discloses cleaning a sputtering target by placing the target in the chamber (Figure 1) and energizing the plasma to 500 watts (example) to clean the target in a plasma. It is inherent that the target is removed when its useful life has expired.

8. Leiphart does not disclose using a magnetron sputtering apparatus for the time of the cleaning.

9. Levine discloses that when sputtering, it is beneficial to use a rotating magnetron behind a target in an apparatus that has an opening for removing and supplying the target so that the plasma will be evenly distributed over the target surface to achieve uniform target erosion (Figure; col. 3, l. 25-33).

10. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Leiphart to utilize a magnetron behind the target because of the desire to achieve a uniform cleaning of the target surface.

11. The time period for cleaning the target surface would not require undue experimentation because one would simply run the process until the target is cleaned.

12. For claim 3, Applicant requires the time period to be 8-10 minutes and the power to be 0.2 kW to 0.4 kW. A power of 500 watts is about 0.4 kW and the time is obvious.

13. For claim 8, the target is titanium. Leiphart discloses a titanium target (Example).

14. Claims 2, 10-15, 17, 19, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,187,151 B1 to Leiphart in view of US 5,846,389 to Levine et al. (Levine) as applied to claim 1 above, and further in view of US 2003/0089601 A1 to Ding et al. (Ding).

15. For claims 2 and 17, Applicant requires the magnetron to be rotatable and the magnetic component to be disposed on less than a 180-degree arc measured at the axis of rotation of the apparatus so as to produce a rotatable sputtering ion plasma on the target. Leiphart in view of Levine discloses rotating the magnetron, but does not disclose the magnetron to be on less than 180 degrees.

16. Ding discloses a sputtering apparatus comprising a rotating magnetron system comprising a magnetron that comprises less than 180 degrees (Figure 1) with corresponding side magnets (Figure 1) that provides the benefit of smaller rotating magnetron is that the target power density can be maximized and results in uniform target erosion [0017].

17. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Leiphart in view of Levine to utilize a magnetron that is less than 180 degrees and rotates because of the desire to maximize the target power density and have uniform target erosion.

18. For claim 10, Applicant requires assembling the assembly into a sputtering apparatus to coat the substrate and then sputtering with the burn-in time reduced by 10%. It would have been obvious to assembly the target into an apparatus and use the target. Reducing the burn-in time by 10% would be inherent.

19. For claims 11 and 14, Applicant requires the time period to be 8-10 minutes and the power to be 0.2 kW to 0.4 kW. A power of 500 watts is about 0.4 kW and the time is obvious.

20. For claims 12 and 15, Applicant requires the target to comprise titanium. Leiphart discloses a titanium target (Example).

21. For claim 13, Applicant requires a treated target assembly made by the method of claim 2. Leiphart discloses a target.

22. For claim 19, Applicant requires the vacuum chamber to comprise a bottom support plate, an upper support plate defining the opening and viton vacuum seal side enclosure. For claim 20, Applicant requires a removable target assembly secured into the opening of the upper support plate. Leiphart in view of Levine discloses the limitation.

23. Claims 9 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,187,151 B1 to Leiphart in view of US 5,846,389 to Levine et al. (Levine) as applied to claims 2 and 17 above, and further in view of US 6,187,457 B1 to Arai et al. (Arai).

24. For claims 9 and 18, Applicant requires the magnet component to be FeNdB. Leiphart in view of Levine does not disclose the magnet component.

25. Arai discloses that using a FeNdB magnet component in a magnetron is common in the art and therefore obvious (col. 6, l. 50-57).

26. Claims 13-15 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US 6,187,151 B1 to Leiphart.

27. Claims 13-15 are described above. Leiphart discloses a used sputtering target of titanium. Claims 13-15 are product by process claims and are thus obvious.

28. "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claims is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985); M.P.E.P. § 2113.

Claim Objections

29. Claims 7, 8, 12, and 15 are objected to because of the following informalities: Claims 8, 12, and 15 utilize improper Markush terminology by stating the target material is "selected from the group comprising" rather than "selected from the group consisting of". Claim 7 depends

from claim 8 and contains all of the limitations of claim 8. Therefore, claim 7 is objected to for the same reasons as claim 8. Appropriate correction is required.

Claim Rejections - 35 USC § 112

30. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

31. Claims 4, 7, and 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

32. Claim 4 depends upon itself and is therefore indefinite.

33. Claim 7 recites the limitation "the enclosure" in line 1. There is insufficient antecedent basis for this limitation in the claim.

34. Claim 15 is out of scope from claim 10 from which it depends. Claim 10 is directed to a method, whereas claim 15 is directed to the treated target assembly.

Allowable Subject Matter

35. Claims 5 and 6 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

36. The following is a statement of reasons for the indication of allowable subject matter: it is neither anticipated nor obvious over the prior art of record to protect and store the target after

removal for storage and shipment as claimed in claim 6. Levine, Leiphart, Arai, and Ding do not disclose or suggest the limitation.

General Information

For general status inquiries on applications not having received a first action on the merits, please contact the Technology Center 1700 receptionist at (571) 272-1700.

For inquiries involving Recovery of lost papers & cases, sending out missing papers, resetting shortened statutory periods, or for restarting the shortened statutory period for response, please contact Denis Boyd at (571) 272-0992.

For general inquiries such as fees, hours of operation, and employee location, please contact the Technology Center 1700 receptionist at (571) 272-1300.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven H VerSteeg whose telephone number is (571) 272-1348. The examiner can normally be reached on Mon - Thurs (6:30 AM - 5:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Steven H VerSteeg
Primary Examiner
Art Unit 1753

shv
November 23, 2004